ERRICCA 2

European Radon Research and Industry Collaboration Concerted Action

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MINUTES OF
4th EUROPEAN ERRICCA 2 MEETING
AT THE
ADMIRAL HOTEL, COPENHAGEN, DENMARK
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Prepared by:
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4th European Radon Forum

10th to 11th November 2003, Admiral Hotel, Toldbodgade 24-28,
DK-1253 Copenhagen, Denmark

Minutes

	Monday 10th November 2003 **Start of Meeting 09.30** **Welcome to Copenhagen –** Christian Lund – Icopal Plastics Membrane A/S CEL Welcomed everybody to Copenahgen. He introduced two colleagues, Aleksandra who assisted in the organisation of the meeting and Bjoern Marcher, a Product Development Manager who works on the development of radon resistant products. CEL also introduced Mr Mads Lyngby Petersen M.Sc and Mr Thommy Larsen M.Sc from the Danish Environmental Assessment Institute who are also the authors of the report 'Reduction of radon – a socio-economic cost benefit analysis'. This report has caused some debate.	
1	**Attendees**	Chris Scivyer – BRE
	RPII David Fenton (DF) Hugh Synnott (HS) **DoE, Ireland** Sarah Neary (SN) **Remedia Limited** Michael O'Gabhlain (MOG) **BRE** Chris Scivyer (CS) Kim Noonan (KN) **NTUA, Greece** Marios Anagnostakis (MA) Evangelos Hinis (EH) **RISOE National Laboratory, Denmark** Claus Anderson (CA) **The Radon Council** Gavin Gillmore (GG) **Hellenic Cement Research Center, Greece** Charoula Malami (CM) **Icopal Plastics Membranes** Christian Erik Lund (CEL)	

	Bjoern Marcher (BM) Alexandra Holboell (AH) **FANC Belgium** Andre Poffijn (AP) **Universidad de Cantabria, Spain** Luis S Quindos Poncela (LQ) **CSN, Spain** Jose Luis Martin Matarranz (JLMM) **STUK, Finland** Hannu Arvela (HA) Valmari Tuomas (VT) **BFS, Germany** Peter Hamel (PH) **Tracerlab, Germany** Horst Kelm (HK) **SSI, Sweden** Anne Louise Soderman (ALS) **Radon Konsult** Per Hallberg (PHall) **Swiss Federal Office of Public Health** Georges Pillar (GP) **ISS Italy** Serena Risica (SR) **Seibersdorf, Austria** Hannes Stadtmann (HStd) **CSTB, France** Bernard Collignan (BC) **KVI, The Netherlands** Emiel Van der Graaf (EVDG) **ENCI, The Netherlands** Pieter Lanser (PL) **Central Mining Institute, Poland** Malgorzata Wysocka (MW) **Czech Tech University** Martin Jiranek (MJ) **Radon VOS, Czech Republic** Martin Neznal (MN) **ZVD, Slovenia** Peter Jovanovik (PJ) **Chamber of Commerce, France** Jean Pronost (JP)	
	Opening address by Mr Mads Lyngby Petersen M.Sc and Mr Thommy Larsen – M.Sc - Danish Environmental Assessment Institute **'Reduction of Radon – a socio-economic cost benefit analysis August 2003'**	
	See Appendix 1 Mads Lyngby Petersen gave a presentation on the cost benefit analysis of radon reduction in Denmark. Thommy Larsen talked of health issues. He gave the background to the report - 300 Danish citizens die each year from lung cancer. There is legislation in	

	place for homes built after 1998 and recommendations for houses built before 1998. It was decided to make an evaluation of costs and benefits which would then enable them to decide on the approach taken on radon. It was concluded that with the Danish recommendations for existing buildings less than 10% of deaths can be avoided annually. Newbuild protection methods are however, inexpensive and therefore cost effective. Maybe more consideration should be given to other causes of death other than radon. Out of 1.4 million homes in Denmark, 3000 dwellings were tested. 200 Bq/m^3 is the action level. An analysis of reduction methods shown - different remedial measures used for different levels of radon in houses. The more effective methods are used if house is above 400 bq/m^3. Less effective methods used if between 200-400 bq/m^3. Each method has a different efficiency. logarithic normal distribution was used in analysis. Health effects - Showed equation used in (Stigum 2003) Using this equation showed a reduction of annual deaths of 29. This is low because work is done only on houses above 200bq/m^3. We need to find out what this means in the Cost Benefit Analysis (CBA). CBA – Showed assumptions made using this analysis. Costs - showed investment costs compared to the lifetime of the remedial measure. WHO and EU use €1.4m per statistical life. Benefits - main benefit is from averted deaths. Results show that there is heavy investment with only few averted deaths. Conclusion is that they should be looking at other means of preventing people dying, although investment costs in new buildings is low and this should continue. EH asked whether there was any percentage of 'error' included in the benefit/cost ratio of 1.62. The cost/benefit ratio was not calculated with an error included. It can be said that the risk factor is higher and lower. DF asked if the analysis was based on remediating 1.4 m houses in Denmark and how many houses have radon problem. It was confirmed that 6.5% of these dwellings are above 200 bq/m^3 and intervention is only needed in these houses.	

	DF asked if the death figure is from the 6.5% above 200 bq/m^3 or from 1.4m houses. It has been calculated from deaths occurring in one family houses in 1.4m. CA commented that the report suggests that it will probably not pay to investigate further. What if in one home a basement is used to sleep 4 children, do we recommend doing nothing. No, a private family with a radon problem can mitigate. CA commented on risk communication – are you suggesting not talking about radon. We have made this analysis and it is important to let people know the risk factor. People should know the risk but should know the other risks in order to compare against. CEL said that the analysis concentrates on existing buildings – it is important to let people know about new houses. Would The Assessment Institute consider making a CBA on new buildings? Not at this moment but maybe in the future.	
1.1	**Adoption of Agenda**	
	See Appendix 2 PH requested moving Other European Issues to front of agenda. Revised agenda adopted	
1.2	**Approval of Minutes**	
	Minutes approved	
1.3	**Actions from Previous Meeting**	
	See Appendix 3 National forums – CS requested reports to be sent In by all to be forwarded to Commission. SR has now received general information for the website from NRPB and asked where they should be sent. CS suggested sending final version to him to be forwarded for the website. 8.1 Questionnaire – CEL only received two responses PHall asked why radon barriers and testing etc is such a big deal as in Sweden radon barriers have a very low	SR to send information to CS to send to NTUA

	market. CS commented that although Sweden does not have a problem other countries do. CEL said that in the industrial forum they would be talking about material testing not just barriers.	
2	**Administration**	Chris Scivyer - BRE
2.1	**Mid-term Report**	
	Some comments were received and any revisions have been made.	
2.2	**Second Annual Report**	
	This is due to be worked on shortly by BRE and will go to the Commission with the cost statements for 2003.	
2.3	**Cost statements**	
	CS emphasised the need for cost statements to be at BRE on time – mid January 2004. Two originally signed copies required.	All partners to complete cost statement form
2.4	**ERRICCA 2 Technological Implementation Plan**	
	A draft has been produced but the Commission has now agreed that for this project it seems inappropriate, therefore the TIP is no longer required.	
2.5	**Plans for next meeting**	
	Only one more meeting of ERRICCA 2. The meeting to be held in UK, hopefully on September 27/28. Would like to consider having national forum on 29th which would give European partners the opportunity to stay on for an extra day to attend the national Forum. CS asked everybody to think about this idea and give feedback at end of meeting. HK asked if the national forum would be similar to Swiss forum. CS confirmed it would be. Presentations will be UK based.	
5	**Other European issues**	**Chris Scivyer - BRE**
5.1	**Long term future for the European Radon Forum and ERRICCA 3 and the CIRCA Network**	
	There are 14 months left on current contract, we now need to think about the future but also ensure that the present work is successful.	

	ERRICCA 2 was based on the success of ERRICCA 1. At this time there was no funding for research and therefore ERRICCA 2 is about bringing people together and people working with their own funding. At the Dublin meeting Jean LDarussin from the EC attended and was keen to be involved in the project. He proposed a radon network – computer based – web based. Some people have used it for discussion. NRPB were invited to put in bid to set up European network. The request passed to BRE as NRPB thought it was linked to ERRICCA 2. There is money available for 2 years to set it up, start time Jan 2004. CS spoke to JLD – he said it is web based for a group of people as part of a network but is not an open network. CS felt this is not good. NRPB have put in a proposal, which is akin to ERRICCA and is as open as possible. In the meantime JLD has now left the EC. It was indicated at the Swiss forum in November by people close to the Commission that there is scope for further funding for ERRICCA - possibly 1-2 years. Maybe in 1-2 years time there may be funding for 2 or 3 research topics on radon. The National forum approach seems well received at Commission. It could lead to an extension of existing contract or new project. EH commented that we already have an ERRICCA website, could we not use this money to continue with it. CS agreed that this is what he would like to do. CEL felt that ERRICCA 1 was heavy on research, ERRICCA 2 was a mix of industry/trade, ERRICCA 3 should bring it even closer to the public. Maybe there is a limit on how much we can research, we should be targeting raising awareness. CS said that one suggestion is that there is a radon week across Europe to raise profile. When we talk about research maybe this will involve developing protocols on raising public awareness rather than fundamental research. PHall asked how CS would like ERRICCA 3. CS replied, raising public awareness – but there are pockets where we do not understand everything. Raising awareness is the way forward. Case studies that are being developed will be useful to people. DF asked if CIRCA network and the NRPB proposal are the same. CS said that the CIRCA is there but nobody is currently leading. It is a new network that is being bid for but will take 2 years to come to fruition. CS asked if anyone else	

	had been sent anything on this. No one indicated having been invited to tender. MA commented that there was e-mail by JLD asking for names of people who have participated in European projects. Does not know anything else.	
3	**National Forum Feedback**	
	A discussion on progress, reporting and future direction. **Denmark** – Nothing from Denmark. **France** – First French forum to take place on 20 November – next forum will hopefully be in 2004. Radon legislation is new in France. The programme was sent to partners. Programme covered health risks, legislation, protection and prevention, remediation and practical cases. Also had a round table discussion. Building professionals, architects invited. **Sweden** – have not had second meeting and as yet no fixed date. Will report at next meeting. **Germany** – Date fixed for 2 December. Will include investigating results and consequences of energy saving methods on radon concentrations. Looking at a standard for radon and radon decay products. A workshop on quality assurance, quality management system in workplaces. Will also discuss the work of the ERRICCA project. **Greece** – In Dublin they described the e-mail on line based forum. There is going to be another meeting with Greek atomic energy Commission. In Spring 2004 there is a Natural Radiation meeting and the national forum will be organised around this time. Also preparing links for online national forum. **The Netherlands** – Meeting planned for 10th December. Trying to organise forum with industrial and scientific people to discuss how radon can be used as a tool. There will be three speakers from science and 2 from industry. There will be approximately 15-20 participants. **Finland** - 2nd forum taken place. Expert seminar first with 60 participants which talked about health and buildings. Industrial people also invited. Citizens seminar took place in evening – widely advertised, press, radio, newspapers – 30 people attended. Topics were the same with shorter presentations. Will have same kind of meeting next year. Feedback was good and gave us insight as to what public feel is more important. CEL asked when it was. STUK said it took place beginning of November. EH suggested people send in details of their meetings and it could be put under 'future events' on website.	

	PH talked of information meetings that have taken place in Sweden to encourage new interest. Householders contacted by letter - 250 householders turned up over 3 nights. Resulted in over 300 measurements in houses that had not previously been measured. Municipals will hold new meeting in Spring with industrial companies. **Slovenia** – meeting to take place end November 2003. Expect more people than last year as meeting being held in high radon area. Have also invited householders, experts and Ministry of Health. **Belgium** – There are three radon risk areas – in each will be held a national forum. Last meeting was over 2 days – 1st day for professionals – 2nd day for public. 40 attendees on each day. Advertised in newspaper. When people came they filed out questionnaire on what they know about radon – they know more about radon now. Next meeting on 20/21 March next year – again 2 days. Will focus on national programme in Belgium - every new builder should be informed of risk. By 2005 all new buildings should be radon safe. Local representatives are used to get messages across to people. Radon in schools and radon in water will be discussed. We will try to convince people they can do things themselves. **Denmark** – Preparing second meeting – will be speaking mainly to professionals. Meeting similar to a course and will give full overview of radon. Programme will cover health, measurement, remediation in existing houses and catalogue on how to remediate houses. CEL to give overview from ERRICCA on dealing with newbuild. The new CBA will be used. Will take place in Jutland – 14th January. 30-40 people expected. Website and e-mail used to advertise. **Ireland** - 2nd Irish radon forum held in Galway in October. 43 attendees – mainly aimed at professional institutes but open to public. Good attendance from institutes, HSE, local government, Northern Ireland environment and heritage. Talked about communicating risk, radon and work places, building regulations and radon prevention. Media interest disappointing. Hoping forum will continue after ERRICCA 2. **Spain** - Forum held in high radon area of Gallicia in North West Spain. Meeting focussed on radon in houses and workplaces – people from industry attended on second day. The Press reported on the first day that radon was a problem in granite areas which are also tourist areas. Granite industry furious. LQ spent next day calming people down and made live TV presentation to put over rational view. Have produced our own conclusions through Spanish link on website. Do not agree with comments from journalists, many towns are high, it is a big problem. The granite	

	industry do not want granite mentioned, just natural stone. **Czech Republic** - 2nd Czech national forum to be held at beginning of December this year. The meeting will be attended by designers contractors and producers of material **Poland** – 2 day workshop and scientific meeting in June 2003. We tried to discuss with politicians and clerks policy for radon. Intercomparison of radon measurement methods and intercomparison on radon in water measurement took place. Because of lack of legislation there is no communication with industry and difficult to discuss with public. Smaller meetings with young students from universities, who may in future influence policy, will take place later in November 03. CEL made the comment that we are all complaining about getting information across – the situation in Poland highlights what happens when there is no legislation. **Italy** – Meeting in Rome postponed as radon national plan not ready – meeting will hopefully be held in 2004. **Switzerland** - Once a year since 1995 an information day has been organised – this year was the first time we had a meeting with industry participating. Took place 3-4 Nov. All ERRICCA partners aware and different cantons aware. Announcement on internet and in technical papers. Three ERRICCA partners attended, CS, CEL and HK. 80 people on first day – 40 from industry. Presentations on ERRICCA, epidemiology, geology, Austria's measurements in schools. Also exhibition of measuring devices, ventilators and different barrier materials. 2nd day 60 people attended. There was a closed session with cantons. Also had industry workshop. There were two presentations from industry – practice of barrier materials on site – how to install on site. We had communication in media which was distributed widely – have not had feedback from press yet. **Austria** – 2nd meeting will be organised in Tyrol, as it is far from Vienna we expect different local participants. Should be general meeting with more focus on local mitigation techniques. Meeting will be promoted by workshop and direct mailing. **UK** – Fewer people this year as other radon meetings had taken place. Representatives from Government, Dept of Health, HSE. Reference made to Building Regulations and how they may be changed in future. NRPB/BGS on combining maps – geology/data. Radon council gave information on training sessions. Request for next year is for more case studies of work done in field. Hope to have next meeting in September and will open to more people.	

4	**Radon Website** – Progress made	**Evangelos Hinis**
	See Appendix 4	
	Showed website to date. At present there is very little general information on radon JB/SR to provide.	ACTION JB/SR
	It was suggested that information about deliverables, timeplan etc., should be included, excluding financial information, under Contracts section.	CS to forward information to NTUA
	Minutes from meetings could be included – CS to forward minutes to NTUA.	CS to forward minutes to NTUA
	Laboratory contributions – it would be useful to have information on laboratories and would like information on everybody's laboratories or links to website.	All partners to provide information
	Topics 1, 2, 3 and 5 do not show any information as NTUA waiting for information from Topic leaders. Topic 4 has information on site.	Topic leaders to supply information
	Case studies were shown. CS confirmed that there are more from Switzerland and Finland to add.	CS to provide
	Links to other websites – Showed links already included.	
	More information on forthcoming events would be very useful.	All to provide
	Country links – have about 70% so far, need to complete these links.	All to provide
	PL commented that he felt the development of the website is taking too long and is lagging behind and felt it was not easy to find information on the site. He has some ideas on how to improve and increase development. Will speak to EH one to one.	PL to speak to EH regarding development of website
	SR felt it did not make sense to put minutes on the site as these just covered discussions. CS asked what peoples views were on this.	
	HA felt that the detailed presentations could be included but should be in pdf format. PH saw no reason why they should not be on the site. CS said that the minutes along with presentations should be on the site. GP felt that the author of the presentation should decide whether their particular presentation should appear on the website. CS asked whether we should then say that the minutes will be on the website and available and if you want your presentation to be included you need to supply it. Is this how it should be done?	
	BC felt it important to have the topic groups first on the site, not the details of the partners and the project. People who	

	are looking for information will not care about contract information. EH said this could be changed. GP commented that on the website we need to show we are making progress on ERRICCA 2. All links should be active and should point to something. Every topic leader should check their topic is on the site. If the radon address is given out it would be good to know there is the information that is required. This is important if we are to ask for money from the Commission, they need to see ERRICCA 2 is successful and the website should be improved fast. EH said that if we cannot get the information to put on the website then maybe we should take out the link. GP said that this is not the solution. EH suggested a structure of pages with links and information from industrial partners, this would show co-operation between science and industry. ALS – SSI are currently working on the Swedish site. Is there a plan for when ERRICCA 2 finishes. What will happen to the site? CS said we do not currently have a plan on how it will continue. We are going to see if there is any funding to progress beyond this stage. This is a problem with all these projects. EH said that they will have to be prepared for the future. They have the tools ready to continue, would like to be optimistic about the future of the site.	
6	**Mapping and Measurement**	**David Fenton – RPII**
6.1	**Progress so far**	**Hugh Synnot RPII**
	See Appendix 5 Hugh Synnot gave presentation **Deliverable 14** - Critical evaluation of radon mapping procedures used in ERRICCA 2 partner countries. Listed the areas to be addressed and outputs. Response to questionnaire – 11 received from 10 countries. Some are not included in analysis as were received late. Questions 1,2 – this showed that out of the countries that responded they had all carried out some form of radon mapping. Usually by the government, some by academic institutes and some private. Question 3 - Mainly indoor gas measurements were used. Question 4 - Showed main findings Question 5 – Showed findings - Answer is no in most	

	cases.	
	Question 6 – In most cases it was academic exercise. To identify radon prone areas was the main use. Main Conclusions are listed on presentation. **Deliverable 15 –** Common measurement techniques and protocols for radon measurement in domestic and workplace environment Listed possible measurement situations and issues that needed to be addressed. Showed response to questionnaire. Showed main findings from countries that responded. Question 1 - Showed list of reference levels in domestic dwellings, workplace (above and below ground) and drinking water. For water 500 bq/litre recently introduced in Ireland. Switzerland and Czech Republic have maximum permitted levels and Guidance level is very similar. Czech guidance levels in water is dependent on use of water – levels vary 20 bq/m^3 50 bq/m^3 100 bq/m^3 Question 6 - Main finding is that an intercomparison exercise is needed. Future work – Still waiting for some questionnaires to be returned. CS commented that the UK is not mentioned – NRPB not responded. AP commented that most of the countries mention the need for comparison exercise. Why, what is reason for this. HS replied that they did not ask why they felt the need, we will chase them for their reasons. CS asked if anyone would say at the meeting why they want an intercomparison. CA said that having access to national standards is one reason. HS asked for questionnaires to be returned in one month. CA asked how the questionnaire on action levels tied in with the report by Gustav Akerblom. HS said they had not had a chance to look at his report but will do so.	RPII to look into intercomparison exercise RPII will chase up questionnaires CS to chase NRPB RPII to ask for reasons why intercomparison exercises needed Partners who have not returned questionnaire to do so in one month RPII to look at G Akerblom report

6.2	**Short versus long term radon measurements**	**Malgorzata Wysocka – GIG**
	See Appendix 6 MW showed map of Upper Silesian in Poland where comparisons in dwellings took place. Charcoal detectors and track detectors used. Charcoal detector exposure was short term - 4 days. Track detector was long term – 3-4 months.	
	At beginning of each campaign detectors were placed at same time and in same place. Charcoal detectors were collected after 4 days. The average radon level in this region not very high. Short term measurements were slightly higher than long term measurements, Results of the measurements were shown relating to geological structure – Triassic showed to be far higher than quaternary and carbon outcrops. Showed measurements in basements which are important as many small businesses are now being run from basements. Again Triassic is higher. Showed statistical analysis of short and long term measurements. This analysis reveals that in some place the interpretation of data obtained of short and long term measurement may lead to different conclusions. Assessment of annual effective doses - such a difference is probably because of temporal variation of radon in buildings. Comparison of annual dose assessment short v long term Must be sure information given to people is correct – people are exposed to other risks other than radon. People do not want to hear any bad information. It is important that information transferred to public is correct. Long and short term measurement almost equal but where soil is not homogenous results are very different. Strata are damaged by mining activity – temporal variation is significant. Assessment of annual doses based on short term measurement may lead to overestimation. Would recommend long term measurements. GG said he was interested to see charcoal being used – are there any real time electronic measurements. MW said 4 days charcoal measurements and 3-4 months etch track.	

	GG asked how we could be sure which one was correct if there were no real time measurements. Are we assuming etch track is correct. MW replied that continuous monitoring was taken in a few houses where short term charcoal was replaced every 4 days. Results obtained by charcoal are sensitive to temporal changes and long term measurement averaged it. For evaluating and assessing doses it is better to have long term than accidental high levels. HA asked what the principle was behind choosing short and long term. SR replied that long term measurements are more accurate but a lot of different laboratories are using only short term measurement, the comparison resulted as a discussion between laboratories. HA said that maybe it is possible that they were done at different seasons. SR said that seasons not very different. EMVD asked whether the short term and long term measurements were calibrated. SR replied they were. EMVD asked whether they had been compared against each other. SR said they had been compared in their radon chamber.	
7	**Group to split into two groups representing Scientific and Industrial partners**	
7.1	**Scientific Forum** Suggested topics so far include : 1. Radon barrier testing – what the regulator and specifier needs. 2. Raising the profile of radon at the European Commission Further suggestions for topics for discussion are welcome.	Chris Scivyer
7.2	**Industrial Forum** suggested topics so far include : 1. Objective of participation in ERRICCA and expectations for outcome 2. Material testing (radon barriers, fans, pipes, sealants etc) from the suppliers view point 3. Membrane installations and in-service performance. Issues relating to installation and in-service requirements i.e. allowing for differential settlement and other movement which might threaten membrane integrity. 4. Remedial work. Experience of remedial methods other than depressurisation.	Christian Lund

	5. Split responsibility as between main contractor and specialist (Radon) sub-contractor Further suggestions for topics for discussion are welcome.	
	Feedback and discussion relating to the separate Fora	
	Scientific forum	
	We need to ensure that ERRICCA 2 is successful so future for ERRICCA 3 is better. Website – everyone to send in information. This is very important. National information needed, if only 70% of flags have information, the flags with no information will be removed. They will be removed by end of 2003. Is there anything else to research? Low energy solutions – if we can demonstrate to commission they may support this. Better understanding of radon dose in work place. Some discussion of standardisation of barrier and component testing – some form of radon testing. Is this for ERRICCA to do, or just for us to say it is required? Communication is key. Pooling study – data being pulled into one study – will see results from this shortly. How we demonstrate risk at lower radon levels.	Partners to submit national information by end 2003
	Industrial forum	
	CEL reported that they had tried to go through all the objectives we have set. Only concentrated on one – expectations of outcome for ERRICCA. All industrial partners are interested in common protocols and common technical standards. Would like ERRICCA 2 to come up with suggestions for areas that require common standard or protocol. Objective of ERRICCA is that we propose this list to EU as subject of NORM Construction Product Directive. CEL to prepare list and will send a realistic deadline to industrial partners for information.	CEL to prepare list and deadline

8	**Testing of radon barrier materials**	
8.1	**Introduction**	**Chris Scivyer/Christian Erik Lund**
8.2	**Testing of radon barrier materials - discussion of results obtained, comments on the aims and philosophy of testing and choosing testing parameters**	**Martin Jiranek**
	See Appendix 7 MJ showed recent situation. Where barrier materials are tested and what parameters are tested. Design of radon proof membrane Results of testing should have some practical usage in production and application stage. Barrier properties should be in balance with other properties, this is very important. In Czech Republic they have chosen radon diffusion coefficient. Have been testing since 1995 – 126 radon diffusion coefficients measured in faculty. Only 4 membranes tested from PO (poly olyfins) category. Diffusion coefficient in bitumen – would draw attention to relatively high dispersion lines or three coefficients. On upper end of dispersion line they could not be considered radon proof. One should be very careful from choosing from this group. Diffusion coefficient in PVC-P membrane – approx 3 times greater than non recycled. Diffusion coefficient in PE Membranes – it can be see the higher the density the lower the radon diffusion. It seems reasonable to introduce limits for radon diffusion coefficients. Showed the possibilities of limiting parameters.	
8.3	**The evolution of laboratory work for measurement of diffusion coefficient in radon barriers**	**Luis Quindos – University of Cantabria**
	See Appendix 8 The paper was accepted. Received very good comments. Have received 6 membranes from Icopal and 2 from Czech	

	Republic. Have derived that some users do not agree. They are applying vapour permeability to radon. Conclusion and parameters we propose are correct. New definition of permeability is correct. Problem is when you are in the laboratory and start work and applying conditions. Described procedure and how you can lose radon. Can be lost but could not find out where leakage was. We expected 10 million bq and only have 1 million. Cannot find leakage. A break was put between upper and lower chamber. The equation in the paper cannot be applied because of leakage. We are trying to change differential equation. Trying to find out if leakage is representable. Hope to be able to take first measurements at end of this year. EVDG said he was not surprised that leaks occurred. Should check if there is pressure build up or air removed. You could also measure upper and lower concentration. You could take continuous measurements – can do direct measurements – if you use pumping you will have leakages. Also If you use tubing not piping. MN said they have not worked with such high concentrations before. EH said they could also put whole chamber in another compartment.	
8.4	**Radon barrier testing: some remarks**	**Emiel Van der Graaf – KVI**
	See Appendix 9 Carried out assessment of LQ's method of barrier testing. Radon partitioning between radon in air and radon in membrane. It is well known radon has high affinity with oil. Showed barrier test method – explained it. Formula given is used in Czech protocol and KVI. Analysis is set to 1. Consequences of setting L to 1 - Showed graph. Value measured depends on thickness of membrane. This is where things can go wrong. Should either standardise thickness in measurements or also measure solubility and include this in predictions for membranes.	
9	**Newbuild Protection**	**Christian Erik Lund – Icopal**
9.1	**Progress so far**	

	See Appendix 10 Not a great deal of progress since Dublin meeting. CEL showed same presentation and commented on changes. D7 - Questionnaires – new deadline was given - showed responses – 10 CEL asked those that have not responded to do so. Would particularly like Austria and Sweden. Will send out questionnaire again with new deadline. Summary of findings - Laws codes and Regs – see list. Poland deregulated is one change. Still no harmonised picture. European legislation – no new laws in force. Enforcement - Ireland will enforce fines if not respectful of legislation Action levels – Will need to deal with in report. Cost implications – showed comparisons of costs in other countries. This will be expanded. Further activity – December is the final deadline for responding to Questionnaire. Will send out reminders.	All to respond to questionnaire, especially Austria and Sweden CEL to send out reminder to respond to questionnaire
9.2	**Pre and post construction evaluation tools of radon protective measures in buildings** **Progress so far and missing information**	**Emiel van der Graaf – KVI**
	See Appendix 11 Went through list of deliverables and progress. Questionnaire distributed – 12 responses so far. Did request more responses at Dublin meeting but have received none. Need more information to make further progress. Report will be finalised in Spring. Will send questionnaire to those who did not respond or will send summary of report with recommendations and conclusions for comments. The present situation in Europe is the part of questionnaire most interested in. Asked for people to respond.	All partners to respond.
9.3	**New building code for Radon to be introduced in Spain at the end of 2003**	**Martin Matarranz - CSN**
	See Appendix 12	

	MM described the new building code. Ministry of Development is drafting the code - Universities are participating – CSN and Cantabria. Gave details of main topics developed. A general statement on radon protection proposed. A radon concentration design level of 200 bq/m^3 for new buildings Showed table of other EU countries national guidelines. Also showed Non European national guidelines. Two levels of radon exposure has been classified – general and specific and showed parameters taken into account. Exposure maps shown giving categories of radon exposure. Showed three levels of protection and preventative measure. This shows difference in permeability of soil. Flowchart drawn up according to risk categories. Showed preventative measures proposed. Two measurement methods used – in soil gas and in new buildings. CEL asked when the code comes into effect. MM said he did not know, possibly at the end of this year. CS commented on the measurement protocols for soil gas and indoor radon, are you requiring test to be carried out or building tested on completion. MM said it is only a recommendation. CS asked if they had been running trials of techniques. MM said no, there is a working group looking at this. CS said that in the UK there is guidance that people are advised to follow. MM said that this was the same – people need to know what they can do but it is not mandatory.	
9.4	**Dutch radon risk evaluation**	**Emiel Van der Graaf - KVI**
	See Appendix 13 Gave history of radon in the Netherlands. since 2001 – policy has been discussed and RPI developed. To be included in building codes but has not happened because of discussions and changes in government. No decision made on RPI, it has been declared controversial. There is now a new Government who want to consider radon risk and need for RPI. There is now an evaluation framework Health/Environment.	

	Dutch risk policy shows maximum tolerable risk of radon at 10-6 – which means we would allow 16 to die from radon each year. Not always feasible and with radon difficult to get to such low level. Some people put themselves at risk and do not worry about risk. Government wants to put these arguments into policy. Radon will be compared with other risks which will undergo the same procedure. See presentation. Evaluation framework will be a questionnaire and has 5 major points of risk that will be assessed – See list. • Impact/Magnitude • Seriousness health effects - Complaints - only few people aware of radon in Netherlands. There are low concentrations in Netherlands, no European drive to do anything. Commotion - will policy affect groups in society. If we go ahead with RPI this could affect building industry. • Perception of effects and risks • Possibility of intervention • Cost and Benefits Fifteen experts are looking at this I discussion meetings. Difficult to come to compromise on comparison of risks – another discussion will be taking place. This will be presented to the Minister who will decide which risk he will act on first. Policy will follow but could take some years before this comes into effect. HA said it would be useful to hear a comment from industrial side. PL said we need to come to appeasement of risks and evaluate risks that are perceived by people. Radon is hardly perceived by anyone. Need to use this study to lift radon onto political agenda. This is the view of industry. CS commented that in the UK there are a lot of different risks and we have examples that we show as comparison. 2500 deaths from radon, death on road 3500 yet people still happy to drive. Perception varies depending on where you live, if you live in these areas, not so concerned. People moving in to radon affected areas are more concerned. Cost is a question - who should pay? It will be interesting to see how this will progress. CEL commented on a recent study of GSM base stations – for past 4 weeks it is continually being discussed in the news – people are worried but as yet do not know that anyone has died from this exposure. It needs to be put into perspective. Cannot get radon argument through with this sort of thing happening. CS agreed and said we have the same in the UK with power stations. People are concerned.	

9.5	**Draft proposals for the revision of the requirements for radon protection in new buildings in Ireland**	**Sarah Neary – Dept of Environment, Heritage and Local Government, Ireland**
	See Appendix 14 Introduced overview of building control and building regulations in Ireland. Building Control Act – Building regulations are split into 12 parts. Radon is in Part C. Health safety and welfare is the purpose of the regulations. Responsibility for complying is with builders, designers and owners. Technical Guidance Documents offer practical guidance and performance levels. Reviewed on ongoing basis and updated regularly. Requirement C3 is specific to radon. Technical Guidance Document C3 recommended that areas with high radon levels should be identified and recommendations made. Precautionary principle made. This puts Ireland to forefront of EU member states mandating radon preventative measures in new buildings.. National reference level set at 200 bq/m^3. RPII undertook National radon survey in Irish dwellings and maps produced. High radon areas were defined. Preventative measures recommended – TGD recommends fully sealed membrane and/or sump. RPII recently carried out survey of radon in new dwellings in Ennis. It was predicted that 27% would have high levels – only 12% had high levels. This proved preventative measures have worked. Similar surveys being carried out elsewhere. International surveys confirmed actions in 1997 were justified. As a result of Ennis survey it shows that guidance is not a guarantee. Guidance document was revised to give greater guidance. TGD being updated – no changes were made to C3 but technical guidance upgraded. Ireland is awaiting the publication of the UK BR211 guidance which is being expanded as they do not currently have guidance on workplaces and other buildings. Radon proof membranes. The guidance does not give	

	specific values – just fit for the purpose of stopping radon. Established in accordance with Part B of building regulations or independent certification. Prepared information leaflet to address insufficient public awareness – information document has been produced on radon prevention systems in new homes. CS asked whether the houses in Ennis were on one site or several. HS said they were within 10 km grid squares on different site.	
10	**Mitigation of Existing Buildings**	Chris Scivyer – BRE
10.1	**Progress with developing a database and draft specification sheets**	
	No presentation – template has been shown before and circulated to all partners. Database split into two sections – main direction consists of two types of case studies and specification sheets. Case studies show work being done. So far only successful case studies, it would be useful to include examples where several attempts have been tried to reduce radon levels. CS thanked those that have submitted completed forms. Czech Rep, Switzerland, Poland, Finland, UK contributions will be put on website. We need to encourage contractors to complete forms – trying in UK through the national forum. Have not had great input from contractors so far. Companies can put their details on the sheet as a form of self promotion. Generic solutions – more akin to solutions that can be applied to any property. Other Issues: • Novel techniques • Increased knowledge radon entry into buildings • Side effects of mitigation. Some information on these issues are coming through on the case studies. We will be providing deliverable via case studies. CS will comment on new techniques and understanding of radon entry into buildings and will send something round in 2 weeks.	CS to send information to partners on new techniques
10.2	**Discussion on the need for a mitigation decision tree**	**Andre Poffijn -**

	and the increased need to consider IAQ when mitigating for radon	**FANC**
	See Appendix 15 Radon mitigation strategies for workplaces. AP presented some ideas and comments that could be of use. Main focus is on schools. Reason for this being the Council directive 96/29/Euratom, and is sensitive matter. Remediation is more cost effective than in private houses and with schools it is possible to communicate to a large population via the children to parents. It was decided to only investigate schools in high risk areas. A decision had to be made whether to measure all rooms or ground floor only and to decide on the duration of measurement, it was decided to start with 3 months. Problem solving - There is a need to evaluate as to whether to mitigate, for this a visual inspection important. Should we only look at radon and other things such as indoor air quality. Many schools in Belgium have radon and indoor air quality problems. Example of a remediated school was given - Visual inspection observed not only radon but moisture problem. Therefore IAQ was dealt with at the same time. Installed balanced ventilation system at ground level. An airtightness evaluation was done, see results. There were many differences between levels of rooms – 2nd floor particularly leaky. Showed follow up results – the whole air movement changed in the building. AP asked RPII if they selected where to measure. HS said that RPII contracted to measure in all primary and secondary schools – 4000 in total. Have measured 3400 to date. They measure radon in all occupied ground floor classes and offices and basements. Measurement period is approx 9 months. They started in 1998 – finished in 2001and have measured 85% of schools – now in process of measuring remaining schools. Reference level in schools is 200 bq/m^3 – advisory level. Of 3400 schools approx 900 had radon levels above 200 in one or more rooms. All these schools have been remediated. In schools with moderate levels – 200-400 bq/m^3 a study done showed ventilation rates in schools were low so vents were installed – found a reduction average of 50% radon levels. Surprised at reduction of levels. Where greater	

	than 400 bq/m^3 we went for sub slab depressurisation – 95% of cases systems worked well, average reduction levels 85-90%. AP commented that the RPII approach was based on curing radon only. HS said the study focused on air quality and it was one recommendation that by improving indoor air quality we may reduce radon levels. DF said they hoped to publish this work as an Institute Report by end of this year. The reason we had 200 bq/m^3 and 400 bq/m^3 ref level is that in 1998 when project began it pre-dated legislation of workplaces. This work would have been impossible with DOE funding. Without Government tackling this issue it would have been impossible to do. PHall commented on measurements. They look at radon ventilation in schools with long term measurements. The radon levels are lower at night than in day time due to ventilation system turned off at night. If you increase input ventilation you can overpressure in some parts of buildings. High pressure inside building can cause humidity problems and mould problems can occur. We are careful about putting in air vents. AP asked about the approach taken in the UK. CS commented that ventilation is one option we always look at. Our houses are becoming more airtight without sufficient ventilation, leading to condensation problems. Schools we were looking at were in Ireland and the reason for this is that Trevor Gregory from Cornwall County Council, who had carried out a lot of work in Cornwall found that Irish schools had certain traits that were common. About 5 years ago all these buildings had been made more airtight to save energy. Humidity In classrooms was very high and more ventilation was needed. We were then invited to look further at these buildings. Cannot ignore ventilation. Needs to be sustainable and permanent – vents must be out of kids reach and they must not cause draughts. In the UK people do not understand how their house works. It is common to lock all windows and doors and open windows upstairs, which will increase the chimney effects. When buying a house there is very limited information on how to operate it. PHall asked whether when you install a ventilation system, do you check on the area of house. CS replied that you can only put so much ventilation in a house. Would look to see how many vents already exist, an airtightness check is very rare. Not precise on diagnostics. PHall said they always calculate pressure in house before any installation. In some cases need to install fan to enforce exchange rate. If you measure different between pressure in and outside you should have solution to problem.	

	CS said that in the UK in existing building, typically 2-3 stories, using smoke puffer where you can see where the air is going can be useful to demonstrate to householders. AP said that for schools where there are compartments under ground, installing a number of sumps is expensive. What is the cheapest method if you deal with large areas. PHall said this is common building approach in Sweden and why we have started to investigate new technique with piping. If there are several suction pipes, need to be careful with freezing – need to consider amount of air to evaluate pressure difference under floor and beneath slab. CS commented that in almost every case in UK we would opt for sump system. One desire we would have is for fans to use less power. In terms of construction – classrooms may have walls to separate – construction below ground is usually leaky. Would find sump would usually draw beyond a dividing wall. The Trevor Gregory approach was to measure each room, target the worse one first, this has often been enough to solve the problem. GP said they only normally measure ground and basement in schools. Measurement performed during heating season for 3 months. Carry out inspection afterwards if 400bq/m^3 exceeded. Visual inspection is important as can pick up moisture problems. Sometimes we perform blower door measurements which can give important information. For detailed examination we will also use continuous measurements. This approach is very important as regards communication with parents. One school's parents refused to send children to school and we had to mitigate in one week. We then asked every parent to make measurement at home – nobody did! ALS said that SSI has been working on protocol for workplaces which should cover schools. Long term measurements taken – if they show higher than 400 bq/m^3 then follow up to be done to measure in school time. Schools are covered by two legislations, the Work Act and the Environment Act. The Environment Act requires annual re-evaluation. Will present more of this protocol at next meeting. CS commented that there has been a case of parents not sending children to school in Israel. Difficult to understand readings as some were taken in air raid shelters underneath the school and unoccupied. Meanwhile I sent information and they decided to install sump system. I thought measurements were long term but were grab samples. Moving from room to room they kept getting different readings. I advised a seven day test. They concluded only one classroom hade problem, they installed sump system but levels rose. I suggested blowing into system which worked. AP asked SR what the situation was in their schools.	

	SR said they had National Survey from 1988-94. It concluded without two regions but these regions did make measurements with same methodology. After National survey – coordinated by ISS and measurements made by local laboratories, the idea was that we could inform the Local Authorities and teach them how to measure radon. All regions now have this methodology. In some regions, but not all, they are very active with a lot of remediation. A plan to have homogeneous government across territories was concluded about a year ago and met agreement with political representative and is now waiting funding.	
10.3	**Possible round table general discussion about novel radon solutions, success rates, technical problems**	
11	**Building Materials**	Marios Anagnostakis - NTUA
11.1	**Progress to date**	
	See Appendix 16 Listed deliverables – D4, D5 and D6 D4 – Common measurement and quality control protocols Questionnaire issued – 60% response, mainly from scientific. MA would welcome response from industrial partners. More responses are needed, only then can we make a review of standards being used. MA asked for a short description of standards mentioned in questionnaires. MA showed standards relating to measurements. Some may be of use to us but need more information. Industrial partners may be able to provide more information. When we have this information we can provide a list of techniques, a small review of techniques and a review of standards. The list could be useful or future work. D5 – Development of measurement standards and models Details given on who sets standards. Constructions Product Directive could be of use to us. Described a Horizontal Standard. Standardisation approach – We can offer an inventory of existing test methods. MA has requested draft mandate and has been proposed to	Industrial partners to respond to questionnaire

	attend the technical committee but has not heard anything yet. D6 – Develop common guidance for testing of radon barrier materials Good work has been done on this. Would propose that the three colleagues that work on this should communicate – Luis Quindos, Martin Jiranek and Emiel Van der Graaf. Anyone else who would like to work on this to find common guidance and differences are welcome. MA listed the points in the proposal for recommendation concerning uses of radon barrier materials. This is the basis for discussion. Final product should be a review of work on membrane testing and recommendations concerning uses of barrier material. CEL commented that Dr Keller, Germany and SSI should also be involved in this work as results of their testing has been widely used. BM said that attention should be draw to work in Norway – Guidelines for preparation of NBI technical approval for radon membranes, Ref: KNN/TNN/KLF Issued 05.09.1997, Revised 09.01.2003. SR said this work by NBI is a form of standard. SR has attended several meetings. There is problem with applicability of levels of activity as we have no limit to apply. The first problem is convincing different member states to implement Radiation Protection 112. It is only a recommendation for a guidance. Should think about what to do to make levels applicable. I can collaborate about gamma radiation. PL said it is of no use to develop European mitigation methods while there is no European reference and this applies to all other health and safety and environment issues under Construction Products Directive. The question is should we focus on content for performance indexes. Could agree with draft mandate with condition that there will be a European guideline which is not compulsory but will enable countries to set guidelines for IAQ. Programme has attention of European officials but hope this is an outline of answer. CS asked if anyone would take and act as the focal point for barrier materials. LQ commented that work is being done, maybe in 2-3 months we will have something to say.	Partners working on this to communicate
11.2	**Practical method for determining radon exhalation rates for building materials and walls**	**Horst Kelm - Tracerlab**

	See Appendix 17 Showed presentation and described procedures used to measure. Practical demonstration. EVDG commented that this is an example of exhalation measurement with closed device. If you have an increased concentration your exhalation rate will increase. Are things taken into account on this instrument. HK said that Professor Keller developed the tool. He said that the tool did work. EVDG asked how it was checked. He said that concentration profile will change when you put something on top which will disturb exhalation rate. The issue was not resolved and the session ended with HK demonstrating the device.	
12	**Increasing Public Awareness**	
12.1	**Development of a toolkit of common guidance for increasing public awareness**	**Chris Scivyer - BRE**
	Asked all to send in examples of public awareness materials. Survey has been carried out via questionnaires. This will be a major part of output. Those who have not done so, please send it examples of public awareness material. Buying and selling industry is helping people to do something in UK. Need to produce information on what is being done.	CS asked all partners to send in examples of pubic awareness material CS to produce information on buying and selling before end Dec 2003
12.2	**Radon bee - new campaign in Finland**	**Hannu Arvela - STUK**
	See Appendix 18 Radon bee aims to test, fix, check HA listed the aims of the campaign, which is directed at health authorities. The role of STUK is to give information and advice to local authorities. STUK is responsible for national communication, radon measurement and lectures, training to local building companies. Follow up and reporting to the Ministry of Health. Gave website address. The role of the municipality is to report on local radon situation and communicate to people, issue of detectors, paying for tests and delivering results. First radon bee took place in Tiirismaa area – see presentation for radon levels in this area.	

	Total number of ground floor flats is 6000. 30% have been measured. Actions and dates of Radon Bee - Advertised in free distribution paper – every household received it. Gives basic radon information and encourages radon measurement. Radon forum supported this advertising. 600 orders for measurements received – very pleased with this response. Follow up of Tiirismaa area – STUK to include mitigation information with measurement results over 200 bq/m^3. Will then send questionnaire asking what householders in this category have done. From 2004-2007 hope to have 20-30 radon bees annually when hopefully radon testing will remain high. CS said this approach is similar to UK, i.e. getting Local Authorities to take lead. HA said they have researched experience from UK and Switzerland and used this when planning campaign. CS said that in UK we have 50% of houses tested in some areas – what sort of % of houses have been tested. HA replied about 30%. PHall asked if local companies will give guarantees of remediation. HA said that STUK can provide training and guidance and give companies a paper to show that they have participated. He felt they should then give guarantee for their work. CS asked what the guarantee should contain. PHall said it should guarantee levels below action level. HA said the first approach is that they should reach 400 bq/m^3 but if careful you can go below 100 bq/m^3. Because we have lack of companies we cannot do tight requirements. We promote them to go into this area to get this experience. PHall said that with highly skilled people coming into this field you could provide set levels. HA said that they would give them guidance on training days – with this guidance I think they should do reasonable work.	
12.3	**An interesting case study in County Kerry, Ireland**	**David Fenton - RPII**
	See Appendix 19 During radon measurement service by RPII a house with radon levels of 49000 bq/m^3 was identified. The house is in Kerry on the border of high radon risk area.	

	Two members of the family have lung cancer, both non smokers, which is very unusual. It was felt we were dealing with people who had been affected by radon. Site visit arranged to speak to householder. Active measurements recorded 4500 bq/m^3. Low radon levels recorded in houses close by. We did follow up action with large media campaign. 2500 householders contacted in 10 km gridsquares. Did not feel take up of measurements was good (400) bearing in mind two people locally had died. Will be doing more to encourage measurements. Remediation work in house – replaced timber floor with suspended concrete floor and fitted extract fan. DF would welcome comments on whether it is highest recorded house. It is highest RPII have ever found. CA asked if 50000 bq/m^3 was the annual average. DF said yes, it was the seasonally adjusted average. MN felt it would be useful to do soil gas measurements around house. There could be some fault. CS asked if it was in just one room where the floor was replaced. DF said yes, rest of house was concrete floor. HStd commented that a house in Tiirol had similar readings. DF said this would be written up early next year. DF asked Hstd if the case he described was published. HStd said it was. CS commented on raising public awareness. How hard was wording used. DF said the facts were stated but could not identify the people. We recommended measurement. We needed to demonstrate that we were doing something. CEL commented that the house was 50 years old and asked if the two houses nearby were younger houses. DF said they were, built in the 1980's. CEL commented that It could suggest that ground beneath house could dry out and create a chimney effect. DF said he would be interested in reading report from Austria.	
12.4	**Round table discussion on issues associated with buying and selling of buildings in radon affected areas and need for common guidance. Including presentation on testing and conveyancing**	**Chris Scivyer – BRE** **Gavin Gillmore – Radon Council**

See Appendix 20

Comparative analysis of short term and long term measuring devices.

This project undertaken by University of Bradford and Northampton College.

GG listed objectives of the research. GG said there was a need for rapid results, particularly when housebuying. Showed detectors used in research and placement of detectors. Used high radon area in Northants. Showed weekly testing. Eletret varied with humidity although not supposed to be affected. UK CON29 form asks question about radon when buying and selling. The Radon Council recommends that all properties should be tested when buying.

Sellers pack is being developed in UK – radon figures quite highly in the pack. As a result of this there could be more requirements for short term testing.

GG commented on seasonal correction factors and the variability of geology. This study highlights that seasonal correction may not be the correct approach. This is in the light of homes in this study having radon levels that did not follow the winter high and summer low that is typical in the UK, possibly due to high porosity of the underlying rocks / sediments.

Recommendations mirror EPA study. EPA recently produced documents for public consumption.

GG then showed the EPA presentation – Health Risk and Solutions - **See Appendix 21**

This is a presentation for people who have no knowledge of radon, it is general information.

Questions/answers

DF commented that the Radon Council recommend testing when conveyancing. Who is responsible, the purchaser or seller. GG replied that the purchaser was responsible.

CA asked about seasonal corrections – have you seen a pattern with house types. GG commented that this is still an ongoing project – this aspect is still being looked at but seen no pattern yet. Different house types seem to show same seasonal peaks

JP asked what type of quality control, what reference is used. GG said they had developed their own system and put to DEFRA to agree protocol.

CS said there were a lot of messages from this presentation. Testing and buying and selling – we all in UK

	agree we want houses tested but there is a question mark still on when to test, short term or long term. Once we get clear advice to householders and buyers about what their result actually means then we will be making progress. There are a number of questions. It is a key driving force in the future in the UK. The Seller pack in UK means that seller will providing key information about their house to purchaser to try and speed up the house purchase. Radon should be included. i.e. is house in radon area, based on mapping. Via the new Sellers Pack the responsibility lies with the seller to provide information. Not sure when this will come into force.	
13	**Administration**	
13.1	**Reports and Deliverables in the next 6 months**	**Chris Scivyer**
	See Appendix 22 Showed outputs to be produced. Reminded people about next 6 monthly report. Kim to send reminder.	KN to remind all partners to send 6 monthly report
13.2	**Date and format of next meeting**	**Chris Scivyer - BRE**
	CS asked if September was a good time to have meeting and should it be Incorporated with National forum. All agreed this would be a good idea. BRE to plan on this basis.	
14	**Any Other Business**	
	GP commented that HA mentioned one issue – training. This should be important for future forum meetings.	
	End of Meeting CS thanked everybody for attending and especially thanked CEL and Aleksandra for their assistance in organising and hosting the meeting. CS thanked KN for her role in organising the meeting and taking the minutes	